Commentary on "Race, Socioeconomic Status, Health-Related Quality of Life, and Self-Care of Type 2 Diabetes Mellitus among Adults in North Carolina"

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The Centers for Disease Control and Prevention initiated the Behavioral Risk Factors Surveillance System (BRFSS) in 1984 to supplement their annual series of surveillance surveys to monitor the prevalence of infectious and chronic diseases, as well as risk factors for future disease in the US population.[1] The BRFSS is a telephone survey conducted at the state level to assess the health behaviors of Americans from smoking to the use of preventive services. These surveys provide a basis for understanding population health and targets for control and prevention in the United States. These efforts have tracked the increasing prevalence of chronic diseases, which now account for 7 of the top 10 causes of death in the United States. Of these, diabetes mellitus may pose the greatest cumulative threat to morbidity, resource expenditures, and mortality, given the broad range of its complications and the management of those complications.

In this issue of the *Southern Medical Journal*, Piper and colleagues analyzed BRFSS data from self-reported diabetics in North Carolina to determine predictors of self-care.[2] Respondents were classified as having good self-care if they took a diabetes mellitus management class/course and checked their blood glucose daily; however, diabetes mellitus type and insulin use were not recorded in the BRFSS. The authors found that diabetics without insurance, with less education, and with lower income levels were less likely to report good self-care. These predictors are consistent with known predictors of diabetes mellitus and health in North Carolina.[3] Together, these results describe a potentially viscous pathway of disparity in which those who are poor and with decreased access to health care are more likely to develop disease, are less likely to care for their disease, and then are more likely to suffer from complications of their disease. Understanding predictors of self-care is an important step in identifying targets to reduce this disparity. A strength of this study is that the sample is representative of individuals with diabetes mellitus in North Carolina and is not focused solely on a subsample such as those with access to health care or more advanced disease. The findings of this study are limited by potential misclassification error because some respondents with type 2 diabetes mellitus managed without insulin may have been falsely defined as practicing poor self-care for less frequent glucose monitoring, which is unnecessary in this group.[4] If these individuals also were more likely to have better health, then this would have biased the results.

The authors also found that individuals with diabetes mellitus who perceived their health as being poor were more likely to practice good self-care even after adjusting for potential demographic confounders. This is consistent with prior work showing that diabetics with worse disease are more likely to be involved in their care. Johnston and colleagues found that veterans with diabetes were more likely to practice good foot self-care if they had a prior foot ulcer,[5] while Nahin and colleagues found that those with worse disease were more likely to pursue alternative medical strategies.[6] Unfortunately, these findings reflect the opposite of prevention. Understanding what motivates diabetics to care for their disease is the first step to targeting interventions to limit complications.

Nearly 1 in 4 individuals with diabetes mellitus in United States has uncontrolled disease with a hemoglobin A1c of >8%, with racial minorities and patients with decreased levels of education predominantly affected.[7] Despite this, the attention of most healthcare providers regarding advances in the management of diabetes mellitus during the last 2 decades was diverted by mega-randomized trials such as the National Institutes of Health–funded Action to Control Cardiovascular Risk in Diabetes study and industry-supported Action in

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Diabetes and Vascular Disease: Preterax and Diamicron-MR Controlled Evaluation study toward defining the optimal hemoglobin A1c target.[8] These trials required hundreds of millions of dollars of funding and resulted in hundreds of published articles, but they found no overall benefit to intensive glucose monitoring and achieved A1c levels in the 6% range versus the 7% range. This work provided no insight into achieving reasonable glucose control for the millions of diabetics with poorly controlled disease who could benefit from such knowledge. Although these large-scale trials are not without merit, alternative research methodologies, including public health initiatives, are needed to help control diabetes mellitus across all patients in the United States.[9]

It must be noted that even with increased public health and continuing clinical efforts to manage patients who already have diabetes mellitus, it is unlikely that the disease burden will be controlled. To some degree, once aberrant glucose metabolism has become entrenched, the horse has left the barn; however, data regarding diabetes mellitus prevention measures provide a basis for optimism. Modest changes in diet and physical activity result in prevention success rates of nearly 50% for those with prediabetes mellitus, a group exceeding 80 million US adults.[10]

Managing the diabetes mellitus epidemic in the United States will require diversion of resources to develop public health measures that complement clinical interventions across the spectrum of disease from prevention to screening to management. For this to be effective, clinicians will need a working knowledge of evidence-based public health practice to ensure these programs integrate with clinical services. Having physicians think about prevention and public health is a paradigm shift away from the isolated strategy of diagnosing patients and prescribing glucose-lowering medications. Efforts to familiarize physicians with the importance of prevention and to mold some into public health leaders are under way. Medical schools are offering dual-degree training in medicine and public health, and schools are increasingly placing students in public health settings such as health fairs. For those already practicing, medical journals such as the *Southern Medical Journal* are exposing clinical audiences to more basic public health research through new sections.[11,12]

References

1. Bauer UE, Briss PA, Goodman RA, et al. Prevention of chronic disease in the 21st century: elimination of the leading preventable causes of premature death and disability in the USA. *Lancet* 2014;384:45–52.
2. Piper CN, Chalakalal S, Sebastian N, et al. Race, socioeconomic status, health-related quality of life, and self-care of type 2 diabetes mellitus among adults in North Carolina. *South Med J* 2015;108:212–216.
3. Konen J, Page J. The state of diabetes in North Carolina. *N C Med J* 2011;72:373–378.
4. Farmer AJ, Perera R, Ward A, et al. Meta-analysis of individual patient data in randomised trials of self monitoring of blood glucose in people with non-insulin treated type 2 diabetes. *BMJ* 2012;344:e486.
5. Johnston MV, Pogach L, Rajan M, et al. Personal and treatment factors associated with foot self-care among veterans with diabetes. *J Rehabil Res Dev* 2006;43:227–238.
6. Nahin RL, Byrd-Clark D, Stussman BJ, et al. Disease severity is associated with the use of complementary medicine to treat or manage type-2 diabetes: data from the 2002 and 2007 National Health Interview Survey. *BMC Complement Altern Med* 2012;12:193.
7. Centers for Disease Control and Prevention. Diabetes public health resource. A1c distribution among adults with diagnosed diabetes, United States, 1988–1994 to 1999–2006. http://www.cdc.gov/diabetes/statistics/a1c/a1c_dist.htm. Accessed December 20, 2014.
8. Boussageon R, Bejan-Angoulvant T, Saadatian-Elahi M, et al. Effect of intensive glucose lowering treatment on all cause mortality, cardiovascular death, and microvascular events in type 2 diabetes: meta-analysis of randomised controlled trials. *BMJ* 2011;343:d4169.
9. Landy DC, Hecht EM. Mega-randomized clinical trials for blockbuster drugs. *JAMA* 2013;309:1682–1683.
10. Lindström J, Ilanne-Parikka P, Peltonen M, et al. Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention: follow-up of the Finnish Diabetes Prevention Study. *Lancet* 2006;368:1673–1679.
11. Landy DC, Gorin MA, O'Connell MT. Student-led rural health fairs: attempting to improve medical education and access to health care. *South Med J* 2011;104:598–603.
12. Holt GR. Broadening the scope of our medical journalism. *South Med J* 2011;104:465.